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**The Official Dictionary
of Telecommunications,
Networking and the Internet**

17th Updated and Expanded Edition
by Harry Newton

NEWTON's TELECOM DICTIONARY

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To b
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important call.

Break Key A Break Key is found on some PCs. It is usually used to interrupt the current task running on a remote host. Break is not an ASCII character; it is simply a period of start (space) polarity.

Break Optimization A call center term. The automatic adjustment of break start times for schedules in the Daily Workfile so as to more closely match staff to workload in each period of the day. The program can thus improve upon the originally scheduled break arrangement because it now has information about schedule exceptions, newly added schedules, and additional call volume in AHT (Average Handle Time) history. See Break Parameters.

Break Out Box A testing device that permits a user to cross-connect and tie individual leads of an interface cable using jumper wires to monitor, switch, or patch the electrical output of the cable. The most common break out box in our industry is probably the RS-232 box. Some of these boxes have LEDs (Light Emitting Diodes), which allow you to see which lead is "live." See also Breakout Box.

Break Parameters A call center term. A group of scenario assumptions you set to govern the placement of breaks in employee scheduling. These are typically:

- Earliest allowable break start time
- Latest allowable break start time
- Duration of the break
- Whether the break is paid or unpaid

Break Test Access Method of disconnecting a circuit, which has been electrically bridged, to allow testing on either side of the circuit. Devices that provide break test access include: bridge clips, plug-on protection modules, and plug-on patching devices. Break test access also provides a demarcation point.

Breakage When a prepaid phone card is never used, the distributor/manufacture gets to keep the money.

Breakdown Set A device that attaches to copper telephone pairs and sends current down the pairs. The current causes the wire to heat slightly, thus slowly drying out the cable. The device is used by telephone companies to dry out pairs of cables which have become wet.

Breakdown Voltage The voltage at which the insulation between two conductors breaks down.

Breaking Strength The amount of force needed to break a wire or fiber.

Breakout A wire or group of wires in a multi-conductor configuration which terminates somewhere other than at the end of the configuration.

Breakout Box A device that is plugged in between a computer terminal and its connecting cable to re-configure the way the cable is wired. When hooking up a terminal that is wired as if it were a computer itself (such as a VT-100), a break out box is used to break out, or fan out the 25 connections in the RS-232 cable. Each wire in the break out box goes through a switch that can be turned off, and a wire jumper is provided to connect each pin on one side to one or the other pin on the other side. This allows you, for example, to switch pins 2 & 3, thus fooling two computer devices into thinking one is talking to a terminal. (Now you have the essence of a null modem cable.) Break out boxes are necessary because there is no such thing as "standard" pinning on an RS-232 cable. To connect one computer to a printer one minute and to another computer the next minute, usually requires totally different wiring in the RS-232 cable, i.e. two sets of cables. This lack of standardization is why you'll always see dozens of RS-232 cables lying around where computers are used.

BRI Basic Rate Interface. There are two subscriber "interfaces" in ISDN. This one and PRI (Primary Rate Interface). In BRI, you get two bearer B-channels at 64 kilobits per second and a data D-channel at 16 kilobits per second. The bearer B-channels are designed for PCM voice, slow-scan video conferencing, group 4 facsimile machines, or whatever you can squeeze into 64,000 bits per second full duplex. The data (or D) channel is for bringing in information about incoming calls and taking out information about outgoing calls. It is also for access to slow-speed data networks, like videotex, packet switched networks, etc. See Basic Rate Interface and ISDN.

Brick A large hand-held cellular phone or handheld two-way radio. In more technical language, a "brick" is a station in the mobile service consisting of a hand-held radiotelephone unit licensed under a site authorization. Each unit can work while being hand-carried.

Bridge 1. In classic terms, a bridge is a data communications device that connects two or more network segments and forwards packets between them. Such bridges operate at Layer 1 (Physical Layer) of the OSI Reference Model. At this level, a bridge simply serves

as a physical connector between segments, also amplifying the carrier signal in order to compensate for the loss of signal strength incurred as the signal is split across the bridged segments. In other words, the bridge is used to connect multiple segments of a single logical circuit. Classic bridges are relatively dumb devices, which are fast and inexpensive; they simply accept data packets, perhaps buffering them during periods of network congestion, and forward them. Bridges are protocol-specific, e.g., Ethernet or Token Ring in the LAN domain. Bridges also are used in the creation of multipoint circuits in the WAN domain, e.g., DDS (Dataphone Digital Service).

Bridges also can operate at Layer 2 (Link Layer) of the OSI Reference Model. At this level, a bridge connects disparate LANs (e.g., Ethernet and Token Ring) at the Medium Access Control (MAC) sub-layer of Layer 2. In order to accomplish this feat, the MAC Bridge may be of two types, encapsulating or translating.

Encapsulating bridges accept a data packet from one network and in its native format; they then encapsulate, or envelope, that entire packet in a format acceptable to the target network. For instance, an Ethernet frame is encapsulated in a Token Ring packet in order that the Token Ring network can deliver it to the target device, which must strip away several layers of overhead information in order to get to the data payload, or content. In order to accomplish this process, a table lookup must take place in order to change basic MAC-level addressing information.

Translating bridges go a step further. Rather than simply encapsulating the original data packet, they actually translate the data packet into the native format of the target network and attached device. While this level of translation adds a small amount of delay to the packet traffic and while the cost of such a bridge is slightly greater, the level of processing required at the workstation level is much reduced.

Bridges also can serve to reduce LAN congestion through a process of filtering. A filtering bridge reads the destination address of a data packet and performs a quick table lookup in order to determine whether it should forward that packet through a port to a particular physical LAN segment. A four-port bridge, for instance, would accept a packet from an incoming port and forward it only to the LAN segment on which the target device is connected; thereby, the traffic on the other two segments is reduced and the level of traffic on the those segments is reduced accordingly. Filtering bridges may be either programmed by the LAN administrator or may be self-learning. Self-learning bridges "learn" the addresses of the attached devices on each segment by initiating broadcast query packets, and then remembering the originating addresses of the devices which respond. Self-learning bridges perform this process at regular intervals in order to repeat the "learning" process and, thereby, to adjust to the physical relocation of devices, the replacement of NICs (Network Interface Cards), and other changes in the notoriously dynamic LAN environment.

While bridges are relatively simple devices, in the overall scheme of things, they can get quite complex as we move up the bridge food chain. (Please don't blame me. I didn't invent this stuff!) Bridges also can be classified as Spanning Tree Protocol (STP), Source Routing Protocol (SRP), and Source Routing Transparent (SRT).

Spanning Tree Protocol (STP) bridges, defined in the IEEE 802.1 standard, are self-learning, filtering bridges. Some STP bridges also have built-in security mechanisms which can deny access to certain resources on the basis of user and terminal ID. STP bridges can automatically reconfigure themselves for alternate paths should a network segment fail.

Source Routing Protocol (SRP) bridges are programmed with specific routes for each data packet. Routing considerations include physical node location and the number of hops (intermediate bridges) involved. This IBM bridge protocol provides for a maximum of 13 hops.

Source Routing Transparent (SRT) bridges, defined in IEEE 802.1, are a combination of STP and SRP. SRT bridges can act in either mode, as programmed.

2. In the context of either audioconferencing (voice) or videoconferencing, a bridge connects three or more telecommunications channels so that they can all communicate together. In either case, compensation is made for signal loss (called balancing) in order to maintain consistent quality, thus allowing all participants to hear and see each other with equal ease. In video conferencing, bridges are often called MCUs — Multipoint Conferencing Units. One feature of some video bridges is their ability to figure who's speaking and turn on the camera which is on that person and have that person's face be on everyone's screen.

3. Finally, we'll explain bridge as a verb, as in "to bridge." Imagine a phone line. It winds from your central office through the streets and over the poles to your phone. Now imagine you want to connect another phone to that line. A phone works on two wires, tip and ring (positive and negative). You simply clamp each one of the phone's wires to the cable

Gas Pressurization / GCRA

action and needed to be replaced by a technician. Newer lightning protectors are made with a gas. When hit by lightning they temporarily short, then re-enable the phone line. This invention has greatly reduced the number of bad lines a phone company has after a storm. Despite their name, there is no carbon in them. Gas carbons are the same size and shape as the older carbon protectors so they fit easily into the old slots.

Gas Pressurization A method for preventing water from entering openings in splice closures or cable sheaths by keeping the cables under pressure with dry gas.

Gas Tube A method of protecting phone lines and phone equipment from high voltage caused by lightning strikes. See CARBON BLOCK (another protection technology) for a more detailed explanation. Here is a definition from American Power Conversion Corp. Gas tube is a surge suppression device that clamps a surge voltage to a limited value. Also called a "spark gap", a gas tube is simply two electrodes that are held at a close distance so that high voltages between the electrodes simply arc through the air or other gas within the tube, thereby effectively clamping the voltage. Gas tubes are very slow, but can handle very large surges. The main problem with the use of gas tubes in AC power circuits is that when they clamp the surge they momentarily short out the utility line which usually trips the circuit breaker feeding the circuit which the tube is connected to. In this case the operation of surge clamping leads directly to power interruption. They are well suited to use in data line surge suppression, but have protective clamping voltages that are too high to provide effective protection for most modems or computer ports.

Gaseous Conductors The gases which, when ionized by an electric field, permit the passage of an electric current.

Gate 1. This term is typically used in Automatic Call Distributors, devices used for handling many incoming telephone calls. Gate refers to a telephone trunk or business transaction grouping that may be handled by one group of telephone answerers (called attendants, operators, agents or telemarketers). That one group of telephone answerers is called "the gate." All calls coming into that gate can, theoretically, be handled by any of the telephone answerers. A telephone call is homogeneous throughout the gate. An automatic call distributor may have one gate — all calls coming in can be handled by everyone. Or it may have many gates, each one consisting of the line (or lines) bringing the call in — e.g. Band 5 WATS, New York City foreign exchange line. Or it may have two gates — one for orders and one for service. ACDs with multiple gates will establish rules for moving the calls between the gates, should one gate become overloaded.

2. A circuit on a silicon chip. See Gate Array.

Gate Array A circuit consisting of an array of logic gates aligned on a substrate (a piece of silicon) in a regular pattern.

Gate Assignments Used in context of ACD (Automatic Call Distribution) equipment. Gates are made up of trunks that require similar agent processing. Individual agents can be reassigned from one gate to another gate by the customer via the supervisory control and display station. Also called splits.

Gate D Gateway Daemon. A popular routing software package which supports multiple routing protocols. Developed and maintained by the GateDaemon Consortium at Cornell University.

Gatekeeper In the classic sense of the word, a gatekeeper is someone who is in charge of a gate. His or her job is to identify, control, count, supervise the traffic or flow through it. A network gatekeeper provides the same functions, including terminal and gateway registration, address resolution, bandwidth control, admission control, etc. A gatekeeper is a fancy name for a network administrator.

Gateway 1. A gateway is what it sounds like. It's an entrance and exit into a communications network. That "communications network" may be huge, for example, at the point where AT&T Communications ends and Comsat begins — for taking my satellite call overseas. Gateways may be small — between one LAN and another LAN. Technically, a gateway is an electronic repeater device that intercepts and steers electrical signals from one network to another. Generally, the gateway includes a signal conditioner which filters out unwanted noise and controls characters. In data networks, gateways are typically a node on both two networks that connects two otherwise incompatible networks. For example, PC users on a local area network may need a gateway to gain access to a mainframe computer since the mainframe does not speak the same language (protocols) as the PCs on the LAN. Thus, gateways on data networks often perform code and protocol conversion processes. Gateways also eliminate duplicate wiring by giving all users on the network access to the mainframe without each having a direct, hard-wired connection. Gateways also connect compatible networks owned by different entities, such as X.25 networks linked by X.75 gateways. Gateways are commonly used to connect people on one net-

work, say a token ring network, with those on a long distance network. According to the OSI model, a gateway is a device that provides mapping at all seven layers of the model. A gateway may be used to interface between two incompatible electronic mail systems or for transferring data files from one system to another. Electronic mail systems that sit on local area networks often have gateways into bigger e-mail systems, like Internet or MCI Mail. For example, I might use MCI Mail to send a e-mail to someone's internal LAN e-mail. It might travel from MCI Mail to Internet via a gateway and then from Internet via another gateway to the company's e-mail on its own LAN.

2. A Gateway is an optional element in an H.323 conference. Gateways bridge H.323 conferences to other networks, communications protocols, and multimedia formats. Gateways are not required if connections to other networks or non-H.323 compliant terminals are not needed. Gatekeepers perform two important functions which help maintain the robustness of the network — address translation and bandwidth management. Gatekeepers map LAN aliases to IP addresses and provide address lookups when needed. Gatekeepers also exercise call control functions to limit the number of H.323 connections, and the total bandwidth used by these connections, in an H.323 "zone." A Gatekeeper is not required in an H.323 system-however, if a Gatekeeper is present, terminals must make use of its services. See TAPI 3.0.

Gateway City A city where international calls must be routed. New York, Washington, DC, Miami, New Orleans, and San Francisco are the five gateway cities in the United States.

Gateway Protocol Converter GPC. An application-specific node that connects otherwise incompatible networks or networked devices. Converts data codes and transmission protocols to enable interoperability. Routers are capable of running gateway protocols — we used to call routers "gateways." Contrast to Bridge.

Gateway Server A communications server that provides access between networks that use different access protocols.

Gating 1. Enabling or disabling a signal through applied logic. If it's turned on, the signal gets through. If not, the signal doesn't get through.

2. The process of selecting only those portions of a wave between specified time intervals or between specified amplitude limits.

Gauge A term for specifying the thickness (diameter) of cables. Thicker cables have a lower number in the American Wire Gauge (AWG) scale. Thicker gauge cables can carry phone conversations further and more cleanly than thinner gauge cable. But thicker cables cost more and take up more room, especially when you bundle them together and put them in a duct. When buying a phone system it is good to specify the thickness of the cables that will be installed — especially if some of your extensions will be a great distance from the central telephone switch, if you intend to carry high-speed data on them or you intend to live with your cabling scheme for more than a few months. You should, of course, not only specify the cable's thickness, but also whether it's stranded or solid core, coax, etc. Gauge is but one part of a cable description. See AWG for a fuller explanation.

Gauge, Wire The method of specifying the thickness and size of wire. The two important American gauges are the American Wire Gauge (AWG), previously known as Brown & Sharpe, and the Steel Wire Gauge. See AWG for a fuller explanation.

Gauss The unit of magnetic field intensity in terms of the lines of force per square centimeter.

Gaussian Noise Gaussian noise, more correctly, is "average white Gaussian noise," also known as "white noise" and "thermal noise." It is the natural noise which occurs when electricity is passed through a conductor, and is due to the random vibrations of electrons in the conductor. Gaussian noise is uniform across the entire range of frequencies involved. Gaussian noise is named after Karl Friedrich Gauss (1777-1855), the German mathematician who is generally recognized as the father of the mathematical theory of electricity. Gauss also invented the "Gaussian Distribution," or "bell curve," which is the frequency distribution of many natural phenomena. See White Noise for more details.

Gazillion An extremely large, indeterminate amount. See Gigabyte.

GB Gigabyte. See Gigabyte.

GBH Group Busy Hour.

Gbps Gigabits per second. Gig is one thousand million bits per second.

GCAC An ATM term. Generic Connection Admission Control: This is a process to determine if a link has potentially enough resources to support a connection.

GCI A TDM (Time Division Multiplexed) bus technology developed by Siemens.

GCRA An ATM term. Generic Cell Rate Algorithm: The GCRA is used to define conformance with respect to the traffic contract of the connection. For each cell arrival the GCRA

determines whether the merit the GCRA, or one is defined with two parts.

GCS Global Communic

GCT Greenwich Civil Ti

GD Graceful Discard.

Discard.

GDDM An SNA defini

used for graphics display

in Macintosh computers

GDF Group Distributi

GDI Graphics Device I

screens, printers, and ot

tions for drawing lines, c

put capabilities; and mo

GDMO Guidelines for

GDOP See Geometric

GE Gigabit Ethernet. S

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